

CEBS: Chemical Effects in Biological Systems – Integrating Biology with Microarray / Proteomics Data

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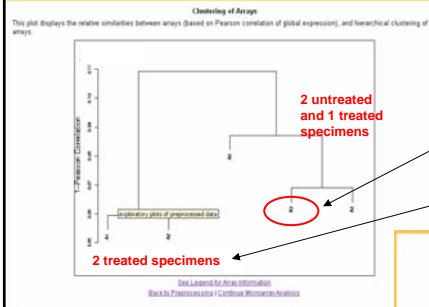


Example from CEBS v1.6

- TODAY'S DATA: 344/N rats treated with 1500 mg/kg acetaminophen
- Three treated rats + two untreated rats
- TOMORROW'S DATA: CDC CAMDA Chronic Fatigue Syndrome; Wichita Study
- ALL DATA GRATEFULLY ACCEPTED!

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Microarray data, 5 rats



unexpectedly, microarray data from one **treated** rat clusters with data from untreated, **not** with data from the **other treated** animals

Legend for Array Information

Label	Experiment ID	Array Name	Sample Name
A1	522295544	1500mg_Acetaminophen_24h_Male_Rat_2018_206559593	1500mg_APAP_24hr_2019
A2	522295544	1500mg_Acetaminophen_24h_Male_Rat_2018_206559594	1500mg_APAP_24hr_2019
A3	522295544	1500mg_Acetaminophen_24h_Male_Rat_2020_206559595	1500mg_APAP_24hr_2020
A4	522295544	1500mg_Acetaminophen_24h_Male_Rat_Pool_206771750	1500mg_APAP_24hr_Pool_2012_2014
A5	522295544	1500mg_Acetaminophen_48h_Male_Rat_Pool_206559665	1500mg_APAP_48hr_Pool_2000_2001_2002

Experiment Information

Experiment ID	Title
522295544	Gene Expression Profiling of F344/N Rat Livers After Acute Acetaminophen Exposure

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[Continue Microarray Analysis](#)

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Look at Clinical Chemistry in CEBS

Search Study by Clinical Chemistry

This page allows you to retrieve a study or studies based on a clinical chemistry test result. Please complete each step before submitting your search. To begin a search, please select one of the test names and input the test value range to perform the search (step 1). You can choose to display results for the respective control animals together with the treated animals (step 2). Since no group level test results exist for studies currently in CEBS, only individual animal test results will be used for the search.

Step 1. Select a clinical chemistry test from the list below:

alanine aminotransferase (ALT)

Step 2. Check here if you want the control animal and group information to be displayed:

☐ ☒ Include Control

All groups containing a subject with ALT > 500 units / L

Study Group Information

This page displays the treatment group information for selected study or studies. The groups with one or more animals that meet the search criteria are displayed. To retrieve test result for selected groups, select the group(s) interested and then click the button at page bottom for each test category. Please note that this page only provides buttons for the test categories that are available for the study.

Alt	Study Number	Group Name	Dosage	Dosage Unit	Treatment Time	Time Unit
<input type="checkbox"/>	NCT008	APAP 1500mg/kg 24h	1500.0	mg/kg	24.0	hr
<input type="checkbox"/>	NCT008	APAP 2000mg/kg 24h	2000.0	mg/kg	24.0	hr
<input type="checkbox"/>	NCT008	APAP 1500mg/kg 48h	1500.0	mg/kg	48.0	hr
<input type="checkbox"/>	NCT008	APAP 2000mg/kg 48h	2000.0	mg/kg	48.0	hr

Phenotypic anchoring:

CEBS Home
Microarray
Proteomics
Systox

CEBS
CHEMICAL
EFFECTS™
BIOLOGICAL
SYSTEMS

NCT: National Center for Toxicogenomics
BIOINFORMATICS to KNOWLEDGE

Clinical Chemistry Results for Selected Group(s)

The clinical chemistry test results for the animals in selected group(s) are displayed in this page. For various experimental reasons, some animals within selected group may not have complete sets of test results for clinical chemistry; some of the animals may have no clinical chemistry test results at all. If a single group is selected, then only the tests that have test values will be displayed; if multiple groups are selected, the tests displayed in the page will cover the entire tests available across the groups.

Study Number: NCT008
Group Name: APAP 1500mg/kg 24h
Intervention: Acetaminophen, 1500.0 mg/kg, 24.0 Hr

Animal Id	total protein (g/dl)	bile acids (uM)	total bilirubin (mg/dl)	ALT (units/l)	SDH (units/l)	ASP (units/l)	AST (units/l)	BNP (units/l)	albumin (g/dl)	glucose (mg/dl)	urea nitrogen (mg/dl)	creatinine (mg/dl)	direct bilirubin (mg/dl)
APAP 1500mg/kg 24h 3018	7.4	254.0	0.6	1600.0	310.0	266.0	2030.0	39.5	4.5	144.0	18.0	0.6	0.1
APAP 1500mg/kg 24h 3019	7.0	294.0	0.3	3690.0	360.0	229.0	5640.0	34.5	4.3	134.0	19.0	0.6	0.1
APAP 1500mg/kg 24h 3020	6	40.4	0.7	80.0	7.9	238.0	104.0	37.5	4.2	206.0	18.0	0.5	0.1
APAP 1500mg/kg 24h 3021	7.0	59.3	0.5	18600.0	134.0	227.0	14000.0	25.5	4.2	136.0	22.0	0.5	0.2
APAP 1500mg/kg 24h 3022	7.6	423.0	0.5	6940.0	316.0	285.0	13120.0	77.0	4.6	158.0	21.0	0.6	0.2
APAP 1500mg/kg 24h 3023	7.1	63.4	0.5	233.0	77.0	227.0	377.0	39.5	3.9	169.0	20.0	0.7	0.1

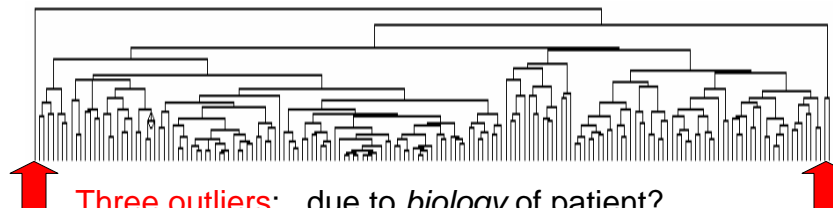
Group Name: APAP 2000mg/kg 24h

Note: Rat 3020 differs in clinical chemistry from biological replicates, as was true with microarray cluster analysis

APAP 2000mg/kg 24h 3106	6.7	571.0	0.5	6320.0	159.0	220.0	11192.0	61.0	4.0	138.0	24.0	0.7	0.1
APAP 2000mg/kg 24h 3107	6.9	393.5	0.5	3840.0	143.0	230.0	6860.0	41.0	4.2	145.0	18.0	0.6	0.1
APAP 2000mg/kg 24h 5019	7.1	167.9	0.5	760.0	0.0	229.0	1070.0	34.0	4.3	161.0	19.0	0.5	0.1
APAP 2000mg/kg 24h 5020	6.7	571.0	0.5	6320.0	159.0	220.0	11192.0	61.0	4.0	138.0	24.0	0.7	0.1
APAP 2000mg/kg 24h 5021	6.9	393.5	0.5	3840.0	143.0	230.0	6860.0	41.0	4.2	145.0	18.0	0.6	0.1
APAP 2000mg/kg 24h 5022	7.4	28.7	0.5	62.0	0.0	198.0	109.0	29.0	4.2	169.0	20.0	0.5	0.1
APAP 2000mg/kg 24h 5023	6.6	399.0	0.5	5600.0	203.0	238.0	9340.0	71.0	4.1	153.0	16.0	0.7	0.1
APAP 2000mg/kg 24h 5024	7.0	128.7	0.5	1130.0	77.0	220.0	1900.0	44.0	3.9	150.0	20.0	0.6	0.1
APAP 2000mg/kg 24h 3108													
APAP 2000mg/kg 24h 3109													

How does this help clinical data analysis?

Expression profiles in “apoptosis genes”
used to cluster 173 patients in dataset from the CDC:



Three outliers: due to *biology* of patient?
or *technical* detail in microarray experiment?

Stay tuned..... we are loading the data into CEBS.

- Production CEBS v1.6
 - <http://cebs.niehs.nih.gov>
- Anticipate CEBS v2.0 in December '05
- ARC = ArrayTrack-research CEBS
 - relational database, integrate biology and phenotype with microarray data
 - loads into ArrayTrack, CEBS (private or public)
- CEBS Development Forum
 - <http://www.niehs.nih.gov/cebs-df/>
- Contact:
 - fostel@niehs.nih.gov